SECTION 238123

COMPUTER-ROOM AIR-CONDITIONERS

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**NOTE TO SPECIFIER**

*Use this Specification Section for Mail Processing Facilities.*

***This is a Type 2 Specification with primarily editable text; therefore, most of the text can be edited, but there is some required text which is noted within the Section with a “Note to Specifier.” Do not revise these paragraphs without an approved Deviation from USPS Headquarters, Facilities Program Management, through the USPS Project Manager.***

*For Design/Build projects, do not delete the Notes to Specifier in this Section so that they may be available to Design/Build entity when preparing the Construction Documents.*

*For the Design/Build entity, this specification is intended as a guide for the Architect/Engineer preparing the Construction Documents.*

*The MPF specifications may also be used for Design/Bid/Build projects. In either case, it is the responsibility of the design professional to edit the Specifications Sections as appropriate for the project.*

*Text shown in brackets must be modified as needed for project specific requirements.* *See the “Using the USPS Guide Specifications” document in Folder C for more information.*

*The last date that USPS revised this standard specification section occurs in two places, at the end of this section and in the Table of Contents. If the date in this section matches the date in the Table of Contents, then you are using the latest version. Do not delete or revise the “last revised” date at the end of the section during the development of the Project Manual.*

*The footer in this section should be edited to replace the text, “USPS MPF SPECIFICATION” with the project name, and the blank date in the center should be replaced with the submission date, for interim design reviews, or the issue date of the completed Project Manual.*

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1. GENERAL
	1. SUMMARY
		1. Section Includes:
			1. Floor-mounted computer-room air conditioners, 6 tons (21 kW) and larger.
	2. SUBMITTALS
		1. Product Data: For each type of product indicated.
		2. Shop Drawings: For computer-room air conditioners. Include plans, elevations, sections, details, and attachments to other work.
			1. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
			2. Wiring Diagrams: For power, signal, and control wiring.
		3. Operation and maintenance data.
	3. QUALITY ASSURANCE
		1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
		2. ASHRAE Compliance:
			1. Applicable requirements in ASHRAE 62.1-2004, Section 4 - "Outdoor Air Quality," Section 5 - "Systems and Equipment," Section 6 - "Ventilation Rate Procedures," and Section 7 - "Construction and Startup."
			2. Applicable requirements in ASHRAE/IESNA 90.1-2004
			3. Fabricate and label refrigeration system to comply with ASHRAE 15-2016, "Safety Standard for Refrigeration Systems."
			4. ASHRAE Standard 34-2016 for safety classifications of refrigerants based on toxicity and flammability data.
			5. ASHRAE Standard 147-2013 for refrigerant leaks, recovery, and handling and storage requirements.
		3. Comply with U.S. EPA Final Rule 21 (40 CFR Part 82 – 81 FR 86778) for acceptability status of substitute refrigerants.
		4. ASME Compliance: Fabricate and label water-cooled condenser shell to comply with ASME Boiler and Pressure Vessel Code: Section VIII, "Pressure Vessels," Division 1.
		5. Comply with any state, fire marshal, building code or other local authority prohibitions or regulations related to flammable refrigerants.
	4. WARRANTY
		1. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of computer-room air conditioners that fail in materials or workmanship within specified warranty period.

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**NOTE TO SPECIFIER**

Verify available warranties and warranty periods for units and components with manufacturers listed in Part 2 articles.

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* + - 1. Warranty Period for Compressors: Manufacturer's standard, but not less than five years from date of Substantial Completion.
			2. Warranty Period for Humidifiers: Manufacturer's standard, but not less than three years from date of Substantial Completion.
			3. Warranty Period for Control Boards: Manufacturer's standard, but not less than three years from date of Substantial Completion.
1. PRODUCTS

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**NOTE TO SPECIFIER**

\*\*Required: Do not modify manufacturers or product requirements listed below without an approved deviation.

Verify manufacturer information, product numbers, and availability at time of Project Manual preparation for Project.

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* 1. FLOOR-MOUNTED UNITS 6 TONS (21 kW) AND LARGER
		1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
			1. Compu-Aire, Inc.
			2. Data Aire Inc.
			3. Koldwave, Inc.; a Mestek company.
			4. Liebert Corporation.
			5. Stulz-ATS.
		2. Description: Packaged, factory assembled, prewired, and prepiped; consisting of cabinet, fans, filters, humidifier, and controls.
		3. Cabinet and Frame: Welded steel, braced for rigidity, and supporting compressors and other mechanical equipment and fittings.
			1. Doors and Access Panels: Galvanized steel with polyurethane gaskets, hinges, and concealed fastening devices.
			2. Insulation: Thermally and acoustically insulate cabinet interior with 1-inch- (25-mm-) thick duct liner.
			3. Finish of Interior Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1-2004.
			4. Finish of Exterior Surfaces: Baked-on, textured vinyl enamel; color.
			5. Floor Stand: Welded tubular steel, with adjustable legs and vibration isolation pads.
		4. Supply-Air Fan(s):
			1. Double-inlet, forward-curved centrifugal fan(s); statically and dynamically balanced.
			2. Drive: V-belt, with steel shaft with self-aligning ball bearings and cast-iron or steel sheaves, variable- and adjustable-pitch motor sheave, minimum of two matched belts, with drive rated at a minimum of two times the nameplate rating of motor.
		5. Refrigeration System:
			1. Compressors: Hermetic reciprocating or hermetic scroll; with oil strainer, internal motor overload protection, resilient suspension system, crankcase heater, manual-reset high-pressure switch, and pump-down low-pressure switch.
			2. Refrigeration Circuits: Two; each with hot-gas mufflers, thermal-expansion valve with external equalizer, liquid-line solenoid valve, liquid-line filter-dryer, sight glass with moisture indicator, service shutoff valves, charging valves, and charge of refrigerant.
			3. Refrigerant: R-407C or R-410A.
				1. Note: As of this update, EPA has not designated a schedule for phase out of R-407C or R-410A in air conditioners. System must comply with U.S. EPA’s Significant New Alternatives Policy (SNAP) program for acceptable substitute refrigerants. If/when EPA deems R-407C and R-410A unacceptable and as that deadline approaches, new generation equipment utilizing lower Global Warming Potential (GWP) hydrofluoroolefin (HFO) refrigerants and blends should be considered.
				2. Refrigerant Compatibility: Parts exposed to refrigerants shall be fully compatible with refrigerants, and pressure components shall be rated for refrigerant pressures.
			4. Refrigerant Evaporator Coil: Alternate-row or split-face-circuit, direct-expansion coil of seamless copper tubes expanded into aluminum fins.
			5. Remote Air-Cooled Refrigerant Condenser: Corrosion-resistant cabinet, copper-tube aluminum-fin coils arranged for two circuits, multiple direct-drive propeller fans with permanently lubricated ball bearings, and single-phase motors with internal overload protection and integral electric control panel. Control capacity by cycling fans. Provide with low ambient control to permit operation down to low temperature observed in project location.
		6. Electric-Resistance Heating Coil: Enclosed finned-tube electric elements arranged for minimum of three stages, with thermal safety switches, manual-reset overload protection, and branch-circuit overcurrent protection.
		7. Refrigerant Heating Coil: Hot-gas coil of seamless copper tubes expanded into aluminum fins with three-way solenoid valve on first-stage refrigerant circuit.
		8. Infrared Humidifier: High-intensity quartz lamps mounted above stainless-steel evaporator pan, serviceable without disconnecting water, drain, or electrical connections; prepiped and using condensate water from cooling coils with stainless-steel or brass float-valve mechanism; located in bypass airstream; with flush-cycle timer and solenoid drain valve.
		9. Disconnect Switch: Nonautomatic, molded-case circuit breaker with handle accessible when panel is closed and capable of preventing access until switched to off position.
		10. Electronic-Control System: Solid state, with start button, stop button, temporary loss of power indicator, manual-reset circuit breakers, temperature control, humidity control, and monitor panel.
			1. Monitor Panel: Backlighted, with no visible indicator lights until operating function is activated; indicators include cooling, humidification, loss of airflow, change filters, high temperature, low temperature, high humidity, low humidity, high head pressure (each compressor), and low suction pressure (each compressor).
			2. Temperature- and Humidity-Control Modules: Solid state, plug-in; with adjustable set point, push-to-test calibration check button, and built-in visual indicators to show mode of operation.
			3. Location: Behind hinged door in front of unit; isolated from conditioned airstream to allow service while system is operating.
1. EXECUTION
	1. INSTALLATION
		1. Install computer-room air conditioners level and plumb, maintaining manufacturer's recommended clearances.
		2. Air-Cooled Refrigerant Condenser Mounting: Install according to manufacturer’s requirements.
	2. CONNECTIONS
		1. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.
		2. Install piping adjacent to machine to allow service and maintenance.
		3. Water and Drainage Connections: Comply with applicable requirements in Division 15 Section "Domestic Water Piping." Provide adequate connections for water-cooled units, condensate drain, and humidifier flushing system.
		4. Refrigerant Piping: Comply with applicable requirements in Division 15 Section "Refrigerant Piping." Provide shutoff valves and piping.
	3. FIELD QUALITY CONTROL
		1. Tests and Inspections:
			1. Inspect for and remove shipping bolts, blocks, and tie-down straps.
			2. After installing computer-room air conditioners and after electrical circuitry has been energized, test for compliance with requirements.
			3. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
			4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
		2. Computer-room air conditioners will be considered defective if they do not pass tests and inspections.
		3. Prepare test and inspection reports.
		4. After startup service and performance test, change filters and flush humidifier.
	4. ADJUSTING
		1. Adjust initial temperature and humidity set points.
		2. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

END OF SECTION

USPS MPF Specification Last Revised: 10/1/2022